

Damper.

Patented Aug. 20, 1861.

Fig. 1.



L. E. Newton.
J. P. Keller.

Fig. 2.



J. F. Smith By Atty. J. Mc Intire.

UNITED STATES PATENT OFFICE.

JOHN J. SMITH, OF ELIZABETH, NEW JERSEY.

METHOD OF OPERATING DAMPERS IN STEAM-HEATING APPARATUS.

Specification of Letters Patent No. 33,107, dated August 20, 1861.

To all whom it may concern:

Be it known that I, JOHN J. SMITH, of Elizabeth, county of Union, in the State of New Jersey, have invented a new and useful
5 Improvement in Steam-Heating Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

10 My invention relates to that class of heating apparatus in which the steam is passed through a coil of pipe or other conduits affording a radiating surface, around which a current of external air is fed and passed and
15 which is conveyed, when heated by said radiating surface, to the apartment to be warmed; and my invention has for its object a novel and effective means of causing the supply of cold air to the radiator to be
20 regulated in a perfect manner to suit the condition or requirements of the air heating apparatus.

It has been customary previous to my invention to so construct that class of heaters
25 to which my present invention relates, as that a damper, placed in the flue, or pipe, through which the cold air was supplied, should be automatically operated, by the pressure of steam, in the boiler supplying
30 the radiator, in such manner that the supply of cold air should be varied in proportion to the variation in the heating agency of the radiator, or the pressure of the steam. This system, however, I do not consider so
35 effective and desirable as that which I have invented, which consists in effecting an automatic operation of the damper, in the cold air supply pipe, through the medium of the expansion and contraction of a portion of,
40 or tube connected directly to, the radiator itself; as will be fully explained hereinafter.

In the accompanying drawings forming part of this specification, Figure 1. is a side view and Fig. 2. a vertical longitudinal section of that part of the apparatus embracing my invention.

In the different views the same characters indicate the same parts of the apparatus.

50 A. is the pipe or flue through which air is supplied to the radiator (in the direction indicated by the arrow.) In this supply pipe is placed the usual damper, or valve, *g.* the positions of which govern or determine the supply of cold air (in Fig. 1. this
55 damper is shown as closed and in the same

condition in black lines in Fig. 2. but as open in the latter figure, by the red lines).

One one side of the pipe or flue A. there is arranged a system of levers which form a connection between the damper *g.* and
60 the radiator, or a tube *b.* connected thereto, (as will be presently explained) by which system of levers the different conditions of the tube *b.* are made to effect different conditions in the damper *g.* as will be fully
65 understood by the following description:— One end of the axis or pivot on which damper *g.* is hung protrudes through side of pipe A. as seen at 1. and has fastened to it an arm *f.* the opposite extremity of this
70 arm *f.* being pivoted to one end of a link *e.* the other end of which is pivoted to the long arm of lever *d.* Said lever *d.* is hung on a stationary center on stud 2. and has its short arm pivoted to one end of a link *c.*
75 the other end of which link is pivoted to the long arm of the angle lever *a.* this angle lever *a.* is hung at 3. on a stationary center or stud, and has its short arm, or toe, in contact with the end or teat of tube *b.* (as
80 clearly illustrated) and said toe or short arm of lever *a.* is always kept in such contact with said end of tube *b.* by means of the spring *r.* which presses continually on the pin *o.* of damper *g.* keeping said damper
85 closed, when not otherwise effected by an overpowering force.

The black and red lines at Fig. 2. show the different relative positions of all the parts just above alluded to effected by the
90 motion of the end or teat of tube *b.*

Now it will be understood that it is proposed to have the teat on portion *b.* a part of the coil, or steam containing portion, of the radiating apparatus, or attached thereto;
95 so that the expansion and contraction of said portion *b.* (of the radiator) consequent to its varying conditions of temperature shall effect a motion in lever *a.* which being imparted, through the system of levers, to the
100 axis of damper *g.* shall cause said damper to be moved, and thus the supply of air through pipe A, or rather the capacity of said air supply pipe to be varied in proportion to the varying temperature of the radiator, or its capacity to heat different quantities of air.
105

The construction and operation of the above described apparatus will be fully comprehended by the explanation already
110

given in connection with the drawings; but
it will be remembered that this apparatus,
or mechanism is only the mode adopted of
carrying out my invention and does not con-
5 stitute the invention itself, which rests in
the idea of the supply of cold air to the heat-
ing surfaces, being always regulated, auto-
matically, so as to be exactly adapted to the
capacity of said heating surfaces, to raise
10 the temperature of the admitted air to the
requisite degree—and it will be observed
that no matter what variations in the heat-
ing capacity of the surfaces occurs these
very variations will always cause a corre-
15 sponding variation in the amount of cold air
imposed on said heating surfaces. It is
obvious that many other mechanical ar-
rangements of parts may be conceived and
employed for conveying the motion (con-
20 sequent to differing temperatures) in pipe *b*,
to the damper, *g*, but such mechanical ar-
rangements are all different modes only of
carrying out my invention.

I do not mean to confound my invention

with an automatic regulation of the damper 25
or valve in cold air supply pipe, irrespective
of the source from which the effect on the
damper arises; for as I have stated in the
beginning it is not original with me; said
damper having before been automatically 30
operated from the varying pressure of the
steam in the boiler; but I am not aware that
the supply of cold air to the heating sur-
faces has ever been controlled by the condi-
tion of said heating surfaces. 35

What I claim as my invention and desire
to secure by Letters Patent is—

Governing the supply of cold air admitted
to the steam heating surfaces by the tem-
perature of the said steam heating surfaces, 40
substantially in the manner and for the pur-
poses hereinbefore described.

In testimony whereof I have hereunto set
my hand this seventeenth day of May 1861.

J. J. SMITH.

Witnesses:

EDMD. F. BROWN,
ELE. R. BROWN.